BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

REMARKS

Applicants' attorney notes with appreciation the examiner's indication of allowable subject matter with respect to claims 7, 11, and 19 through 24. Although claim 15 was not included in that indication, because claim 15 was not rejected based upon the references relied upon, and because claim 15 claims subject matter similar to the subject matter claimed in claims 7 and 11, applicants have assumed that claim 15 is also directed to allowable subject matter.

Claims 2 and 3 were rejected as indefinite on the ground of a lack of antecedent basis. Each of those claims has been amended to overcome that ground of rejection. Similarly, dependent claims 12 and 20, which depend from claim 2, and dependent claims 16 and 21, which depend from claim 3, have also been correspondingly amended. Accordingly, all the claims in the application are now believed to be in definite form.

Claims 1 through 3, 8, 12, and 16 were rejected as obvious in view of the disclosures contained in the van Rooij et al., Chiba et al., and Sakate et al. references that were cited and relied upon by the examiner. In that regard, the van Rooij et al. reference, which was apparently cited merely for its showing of one form of a transmission chain intended to be utilized with a conical pulley transmission, relates to an entirely different problem from that to which the present invention is directed. More specifically, that reference is directed to reducing the noise level encountered in power transmission chains, and also to reducing the number of parts from which such chains are assembled. There is no disclosure in van Rooij et al. of surface treatment of either

chain components or of conical disk surfaces to enable higher operating loads or to provide longer durability of such elements of a power transmission system. Indeed, the examiner recognized that deficiency by observing that the reference does not disclose surface hardening of pulley surfaces and rocker pin surfaces.

The Chiba et al. reference was cited for disclosing surface hardening of conical pulley surfaces. However, that reference is directed to the problem of adhesion or peel-off of material from the pulley surfaces (see Chiba et al., col. 2, lines 10 through 12). And it therefore is directed solely to hardness treatment of the pulley surfaces (see Chiba et al., col. 2, lines 24 through 28). Although Chiba et al. discloses that a belt is utilized in conjunction with the pulleys of a continuously variable transmission, it is utterly silent regarding any treatment of the belt – it confines the surface treatment to only the pulley surfaces, not to any parts of the drive belt. Indeed, each of the examples provided in the Chiba et al. reference deals only with pulley halves. Thus, in addition to being directed to the solution to an entirely different problem, the Chiba et al. reference also does not teach or suggest the present invention as claimed, in which both conical disk surfaces as well as those transmission belt surfaces that contact the conical disk surfaces each have a nitrogen-enriched outer layer in the form of a carbon-nitrided layer.

The Sakate et al. reference was cited on the ground "that it is well known in the art to surface harden contact surfaces through nitriding and case hardened so as to improved the smoothness of the surfaces and reduce friction." Again, however, as was the case with each of the van Rooij et al. and Chiba et al. references, the Sakate et al. reference also is directed to a different problem. In the case of the

Sakate et al. reference the problem is to provide smooth surfaces for the purpose of reducing surface friction. In that connection, the Sakate et al. reference teaches smoothing the contact surfaces in a poppet valve actuation system of an internal combustion engine.

The surface of a steel shim serves as a cam follower and is carried on a valve tappet that slidably engages with a cam member. Each of those elements is treated to reduce surface friction to as low a level as possible (see Sakate et al., col. 5, lines 55 through 57). The steel shim is first subjected to a shot blasting treatment to provide a surface having a surface roughness that falls within a predetermined range, after which the surface is hardened by nitriding. There then follows a running-in step with the cam and cam follower in contact with each other, whereby the harder cam follower surface grinds and polishes the surface of the cam (see Sakate et al. col. 6, line 59 through col. 7, line 9). As a result, the cam and cam follower surfaces are finished during the running-in step to each have smooth surfaces to reduce the surface friction therebetween (see Sakate et al., col. 7, lines 31 and 32).

In addition to being directed to the solution to an entirely different problem, one of reducing friction between two surfaces, the Sakate et al. reference also does not teach or suggest the present invention as claimed. It does not teach or suggest that both the cam and the cam follower have a carbon-nitrided outer layer. Nor does it teach or suggest the conical surfaces of conical disks as well as those transmission belt surfaces that contact the conical disk surfaces each have a nitrogen-enriched outer layer in the form of a carbon-nitrided layer.

Even more significant, however, is that fact that the Sakate et al. reference teaches away from the present invention in that it is directed to reducing sliding friction between two components. The torque-transmitting structure to which the present invention is directed, on the other hand, requires frictional contact between two components in order to be able to transmit the desired torque. If the friction between the transmission belt and the conical disks were to be reduced in the manner taught by Sakate et al., slippage between the transmission belt and the conical disks would occur, thereby defeating the purpose of the transmission.

As noted above, each of the references relied upon by the examiner relates to a different problem than that to which the present invention is directed. Thus, one having only ordinary skill in the art would not be led to combine the teachings of those references as the examiner has done. The only motivation for combining the references in that manner is the present disclosure, and to use the teachings of the present invention to assemble references that are directed to different problems is an improper hindsight reconstruction of the prior art while having applicants' invention in mind. In essence, that combination of references is based upon using the present disclosure as a template or a road map through the prior art, because the references themselves do not contain any disclosures that would lead one of ordinary skill in the art to combine them as the examiner has done. Clearly, when the references relied upon are viewed by themselves and without the benefit of the present disclosure, those references provide no motivation that would lead one having only ordinary skill in the art to combine them as the examiner has done and to arrive at the claimed invention.

Additionally, even if one were to combine the teachings of the references relied upon, the resulting combination would defeat the purpose of the transmission, which is to frictionally transmit torque by frictional engagement of a drive belt with the surfaces of conical pulley disks. Because the Sakate et al. reference, when it is considered in its entirety, teaches reducing friction between two components, its combination with van Rooij et al. and Chiba et al. would result in a structure that would be inoperative to transmit torque, because the transmission belt would slide relative to the conical disk surfaces as a result of the reduction of friction therebetween.

Based upon the foregoing amendments and remarks, the claims as they now stand in the application are believed in definite form. Additionally, the claims clearly patentably distinguish over the disclosures contained in the references that were cited and relied upon by the examiner, whether those references be considered in the context of 35 U.S.C. § 102 or of 35 U.S.C. § 103. Consequently, this application is believed to be in condition for allowance, and reconsideration and reexamination of the application is respectfully requested with a view toward the issuance of an early Notice of Allowance.

The examiner is cordially invited to telephone the undersigned attorney if this Amendment raises any questions, so that any such question can be quickly resolved in order that the present application can proceed toward allowance.

Respectfully submitted,

March 22, 2004

Alfred J. Mangels
Reg. No. 22,605
4729 Cornell Road
Cincinnati, Ohio 45241
Tel.: (513) 469-0470